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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,474	03/03/2005	Koji Tatsumi	OHA-008	1863

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EXAMINER	
LEWIS, BEN	
ART UNIT	PAPER NUMBER
1745	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,474	TATSUMI ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 03 March 2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoya (U.S. Patent No. 6,805,996 B2) in view of Biensan et al. (U.S. Patent No. 6,071,645)

With respect to claims 1,3,5 and 6, Hosoya disclose a positive electrode active material (title) wherein, positive electrode active material, a lithium transition metal composite oxide, represented by a general formula $LiCo_x A_y B_z O_2$, where A denotes at least one selected from the group consisting of Al, Cr, V, Mn and Fe, B denotes at least one selected from the group consisting of Mg and Ca, and x, y and z are such that $0.9 <= x < 1$, $0.001 <= y <= 0.05$ and $0.001 <= z <= 0.05$ (Col 4 lines 25-45). Hosoya does not specifically teach that "B" is a group-IV transition element. However, Biensan et al. disclose a lithium electrode for a rechargeable electrochemical cell (title) wherein, the electrode for a rechargeable lithium cell, contains an electro-chemically active material with general formula $Li_x M_y A_m D_z O_t$, $0.8<=x<=1.2$; $0.8<=t<=4.2$; $(0.8-m-z)<=y<=(2.2-m-z)$; $0<=z<=0.3$; $0<m<=0.3$; where M is at least one transition metal selected from nickel, cobalt, manganese, and iron, A is selected from magnesium and calcium, and D is at least one element selected from the elements of groups 4b to 5a of the periodic

classification. In the formula, Li represents lithium and O is oxygen. The term "element from groups 4b to 5a of the periodic classification" (HANDBOOK of CHEMISTRY and PHYSICS, 46.sup.the Edition) means the elements from Ti, Zr, etc "group IV transition element". . . , to Sb, Bi. D is preferably at least one metal selected from titanium, zirconium, vanadium, chromium, molybdenum, copper, zinc, cadmium, aluminum, gallium, and tin. Doping elements D substitute for a portion of the transition metal which defines the structure of the material (Col 1 lines 35-67). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the group IV transition element of Biensan et al. as a "B" site element into the electrode of Hosoya because Biensan et al teach that addition of a dopant such as Sn, Ti "group IV transition element" Cu, or Cd reduced the loss of capacity to values in the range 20% to 25% (Col 6 lines 15-25).

With respect to claim 2, Hosoya teach that in the positive electrode active material, according to the present invention, which uses a compound as a solid solution of a combination of a first group-consisting of Al, Cr, V, Mn and Fe and a second group consisting of Mg and Ca is substituted for part of Co, not only the stability at ambient temperature but also that at elevated temperatures may be improved (Col 2 lines 45-51).

With respect to claim 4, Hosoya teach that $LiCo_{0.98}Al_{0.01}Mg_{0.01}O_2$ was synthesized in the same way as sample 1, except mixing lithium carbonate, cobalt

oxide, aluminum hydroxide and magnesium carbonate to a Li:Co:Al:Mg molar ratio of 1.02:0.98:0.01:0.01 (Col 10 lines 5-15).

With respect to claim 7, Hosoya as modified by Biensan et al. disclose a lithium electrode for a rechargeable electrochemical cell in paragraph 2 above. The instant specification recites: a positive electrode for a secondary lithium-ion cell having high cycle durability and high safety in high-voltage and high-capacity applications, which is a particulate positive electrode active material for a secondary lithium-ion cell represented by a general formula, $Li_aCO_bA_cB_d O_e F_f$ (A is Al or Mg, B is a group-IV transition element, 0.90.ltoreq.a.ltoreq.1.10, 0.97<=b<=1.00, 0.0001<=c<=0.03, 0.0001<=d<=0.03, 1.98<=e<=2.02, 0<=f<=0.02, and 0.0001<=c+d<=0.03), where element A, element B and fluorine are evenly present in the vicinity of the particle surfaces (See Abstract).

Biensan et al. do not disclose any X-ray diffraction data. However, it is the position of the examiner that such properties are inherent, given that Beinsan et al and the present application utilize the same electrode active material comprising the same elements. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoya (U.S. Patent No. 6,805,996 B2) in view of Biensan et al. (U.S. Patent No. 6,071,645) and further in view of Naruoka et al. (U.S. Pub No. 2002/0086210 A1).

With respect to claim 8; Hosoya as modified by Biensan et al disclose a positive electrode active material in paragraph 2 above. Hosoya as modified by Biensan et al do not specifically disclose the average particle diameter of the positive active material. However Narouka et al. disclose a positive active material for non aqueous electrolyte secondary battery (title) wherein, The positive active material preferably has a mean particle diameter D_{50} of from 4μm to 25μm and a BET specific surface area of from 0.2 to 1.5 m^2/g (Paragraph 0026). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the same particle size of Narouka et al. for the particle size of the positive electrode active material of Hosoya as modified by Biensan et al. because Narouka et al. teach that by using a lithium-nickel composite oxide having a mean particle diameter D_{50} of from 4μm to 25μm as a positive active material, the capacity density can be kept high (Paragraph 0023).

With respect to the particles being formed by coagulation of 10 or more primary particles, Hosoya as modified by Biensan et al. and Narouka et al. do not specifically teach particle coagulation. However, it is the position of the examiner that such properties are inherent, given that Hosoya as modified by Biensan et al. and Narouka et al. and the present application utilize the same same electrode active material comprising the same elements of the same particle size. A reference which is silent

about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoya (U.S. Patent No. 6,805,996 B2) in view of Biensan et al. (U.S. Patent No. 6,071,645) and further in view of Naruoka et al. (U.S. Pub No. 2002/0086210 A1).

With respect to claim 9, Hosoya disclose a positive electrode active material (title) wherein, positive electrode active material, a lithium transition metal composite oxide, represented by a general formula $LiCo_x A_y B_z O_2$, where A denotes at least one selected from the group consisting of Al, Cr, V, Mn and Fe, B denotes at least one selected from the group consisting of Mg and Ca, and x, y and z are such that $0.9 <= x < 1$, $0.001 <= y <= 0.05$ and $0.001 <= z <= 0.05$ (Col 4 lines 25-45). Hosoya does not specifically teach that "B" is a group-IV transition element. However, Biensan et al. disclose a lithium electrode for a rechargeable electrochemical cell (title) wherein, the electrode for a rechargeable lithium cell, contains an electro-chemically active material with general formula $Li_x M_y A_m D_z O_t$, $0.8<=x<=1.2$; $0.8<=t<=4.2$; $(0.8-m-z)<=y<=(2.2-m-z)$; $0<=z<=0.3$; $0<m<=0.3$; where M is at least one transition metal selected from nickel, cobalt, manganese, and iron, A is selected from magnesium and calcium, and D is at least one element selected from the elements of groups 4b to 5a of the periodic classification. In the formula, Li represents lithium and O is oxygen. The term "element from groups 4b to 5a of the periodic classification" (HANDBOOK of CHEMISTRY and

PHYSICS, 46.sup.the Edition) means the elements from Ti, Zr, etc "group IV transition element". . . , to Sb, Bi. D is preferably at least one metal selected from titanium, zirconium, vanadium, chromium, molybdenum, copper, zinc, cadmium, aluminum, gallium, and tin. Doping elements D substitute for a portion of the transition metal which defines the structure of the material (Col 1 lines 35-67). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the group IV transition element of Biensan et al. as a "B" site element into the electrode of Hosoya because Biensan et al teach that addition of a dopant such as Sn, Ti "group IV transition element" Cu, or Cd reduced the loss of capacity to values in the range 20% to 25% (Col 6 lines 15-25).

Hosoya as modified by Biensan et al do not specifically disclose the average particle diameter of the positive active material. However Narouka et al. disclose a positive active material for non aqueous electrolyte secondary battery (title) wherein, The positive active material preferably has a mean particle diameter D_{50} of from 4μm to 25μm and a BET specific surface area of from 0.2 to 1.5 m^2/g (Paragraph 0026). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the same particle size of Narouka et al. for the particle size of the positive electrode active material of Hosoya as modified by Biensan et al. because Narouka et al. teach that by using a lithium-nickel composite oxide having a mean particle diameter D_{50} of from 4μm to 25μm as a positive active material, the capacity density can be kept high (Paragraph 0023).

With respect to the preparation of the positive active material, Hosoya teach that a method for the preparation of a non-aqueous electrolyte secondary cell including a positive electrode, a negative electrode and a non-aqueous electrolyte interposed between the positive and negative electrodes, including, in producing positive electrode, the steps of mixing a cobalt compound, a lithium compound, a compound of at least one element selected from the group consisting of aluminum, chromium, vanadium, manganese and iron and a compound of at least one element selected from the group consisting of magnesium and calcium, at a pre-set ratio, and sintering a mixture from the mixing step to produce a compound represented by the general formula $LiCo_x A_y B_z O_2$ (Col 3 lines 30-45).

With respect to cobalt raw material, Hosoya teach that for the cobalt compounds, inorganic salts, such as cobalt carbonate or cobalt sulfate, oxides, such as cobalt oxide or hydroxides, may be used without limitations (Col 7 lines 25-35).

With respect to lithium carbonate, Hosoya teach that, commercially available lithium carbonate, aluminum hydroxide and magnesium carbonate were mixed at a Li:Co:Al:Mg molar ratio of 1.02:0.989:0.001:0.01. The resulting mixture was charged into an alumina crucible and sintered in a dry atmosphere (Col 9 lines 19-30).

With respect to the particles being formed by coagulation of 10 or more primary particles, Hosoya as modified by Biensan et al. and Narouka et al. do not specifically teach particle coagulation. However, it is the position of the examiner that such properties are inherent, given that Hosoya as modified by Biensan et al. and Narouka et

al. and the present application utilize the same same electrode active material comprising the same elements of the same particle size. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SUSY TSANG-FOSTER
PRIMARY EXAMINER